Montana Department of
ENVIRONMENTAL QUALITY

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December 5, 2014

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Ladies and Gentlemen:

To comply with the Administrative Rules of Montana (ARM), specifically ARM 17.4.607(2), 608, 609 and 610, the Department of Environmental Quality (DEQ) has prepared the enclosed Environmental Assessment (EA). This EA addresses the proposed expansion of the Allied Waste Systems of Montana, LLC, Class II landfill. The proposal will expand the licensed facility into a 144-acre parcel located immediately northwest of the current landfill. The new expansion area will add an additional 45 years to the remaining 13-year facility life, increase the total acreage available for landfill disposal by 86 acres, and provide for the disposal of an additional 15.7 million cubic yards of solid waste.

The purpose of this EA is to inform all interested governmental agencies, public groups and individuals of the proposed action, and to present DEQ's findings on the proposal. Persons wishing to comment have until the close of business on January 2, 2015, to submit written comments concerning the proposal. DEQ will not make a licensing decision until after the comment period has ended. A complete color copy of the EA may be viewed on DEQ's website at: http://deq.mt.gov/ea/WasteMgt.mcpx. DEQ will host a public meeting on Wednesday, December 10, 2014, from 5:30 to 7:30 p.m. in the large meeting room at the Missoula Public Library to provide information on the licensing process and to receive comments on the proposal.

If you wish to comment on this proposed action within the 30-day public comment period, please do so in writing by mailing your comments to the Waste and Underground Tank Management Bureau, Solid Waste Program, P.O. Box 200901, Helena, MT 59620-0901 or by E-mail to mailbox wutbcomments@mt.gov.

Sincerely,

Mary Louise Hendrickson

Mary Louise Hendrickson
Solid Waste Licensing Program - Project Lead
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Enclosure: Allied Waste Systems of Montana, LLC, Missoula Landfill Expansion EA

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
Permitting and Compliance Division
Waste and Underground Tank Management Bureau
Solid Waste Section
PO Box 200901
Helena, MT 59620-0901

ENVIRONMENTAL ASSESSMENT

SOLID WASTE SECTION ROLES AND RESPONSIBILITIES:

The Department of Environmental Quality (DEQ) is responsible for ensuring activities proposed under the Solid Waste Management Act (SWMA), the Septage Disposal Licensure Act, and the Motor Vehicle Disposal & Recycling Act are in compliance with current regulations. The Solid Waste Section (SWS) is a part of DEQ's Permitting and Compliance Division, Waste and Underground Tank Management Bureau. The Solid Waste Management Act (75-10-201, MCA) and the Administrative Rules of Montana (ARM), Title 17, Chapter 50 provide the necessary authority for the SWS to license and regulate solid waste management systems (SWMS) in the state of Montana.

SECTION 1.0 – PROJECT DESCRIPTION:

Republic Services, Inc. (applicant) submitted an SWMS application for expansion of the currently licensed and active Allied Waste Systems of Montana, LLC (AWSM) Missoula Class II Landfill facility. AWSM is a wholly-owned subsidiary of Republic Services, Inc. The applicant proposes to expand the currently active AWSM landfill into a 144-acre parcel located immediately northwest of the active facility (see Figure 1.1). The expansion area will add an additional 45 years to the remaining 13-year facility life, increase the total acreage available for landfill disposal by 86 acres, and provide for the disposal of an additional 15.7 million cubic yards of solid waste.

Purpose of the Environmental Assessment:

In accordance with 75-1-102, MCA, the Montana Environmental Policy Act (MEPA) is procedural and requires the "adequate review of state actions in order to ensure that environmental attributes are fully considered by the legislature in enacting laws to fulfill constitutional obligations; and the public is informed of the anticipated impacts in Montana of potential state actions." According to MEPA, environmental assessments (EA's) are the procedural documents that communicate the process agencies follow in their decision-making. An EA does not result in a certain decision, but rather serves to identify the potential effect of a state action within the confines of existing laws and rules governing such proposed activities so that agencies make balanced decisions. The MEPA process does not provide regulatory authority beyond the authority explicitly provided in existing statute.

The SWMA laws and rules establish the minimum requirements for the design and operation of SWMS's. The EA is the mechanism that DEQ uses to: 1) Disclose whether a proposed site meets the minimum requirements for compliance with the current laws and rules; 2) Assist the public in understanding the state SWMA regulations as they pertain to licensing solid waste facilities; 3) Identify and discuss the potential environmental effects of the proposed site if it is approved and becomes operational; 4) Discuss actions taken by the applicant and the enforceable measures and conditions designed to mitigate the effects identified by DEQ during the review of the application; and 5) Seek public input to ensure DEQ has identified the substantive environmental impacts associated with the proposed landfill.

Benefits and Purpose of the Proposal:

The main objective of the proposal is to provide for the continued disposal of municipal solid wastes currently managed at the AWSM landfill facility. The addition of the 144-acre parcel and development of the proposed landfill expansion area will extend the life of the facility by adding 45 years to the remaining 13-year life of the active AWSM landfill facility. The proposed expansion will also allow the applicant to continue operations based on the current disposal cost structures and avoid costs associated with the siting and development of a new facility at a new location.

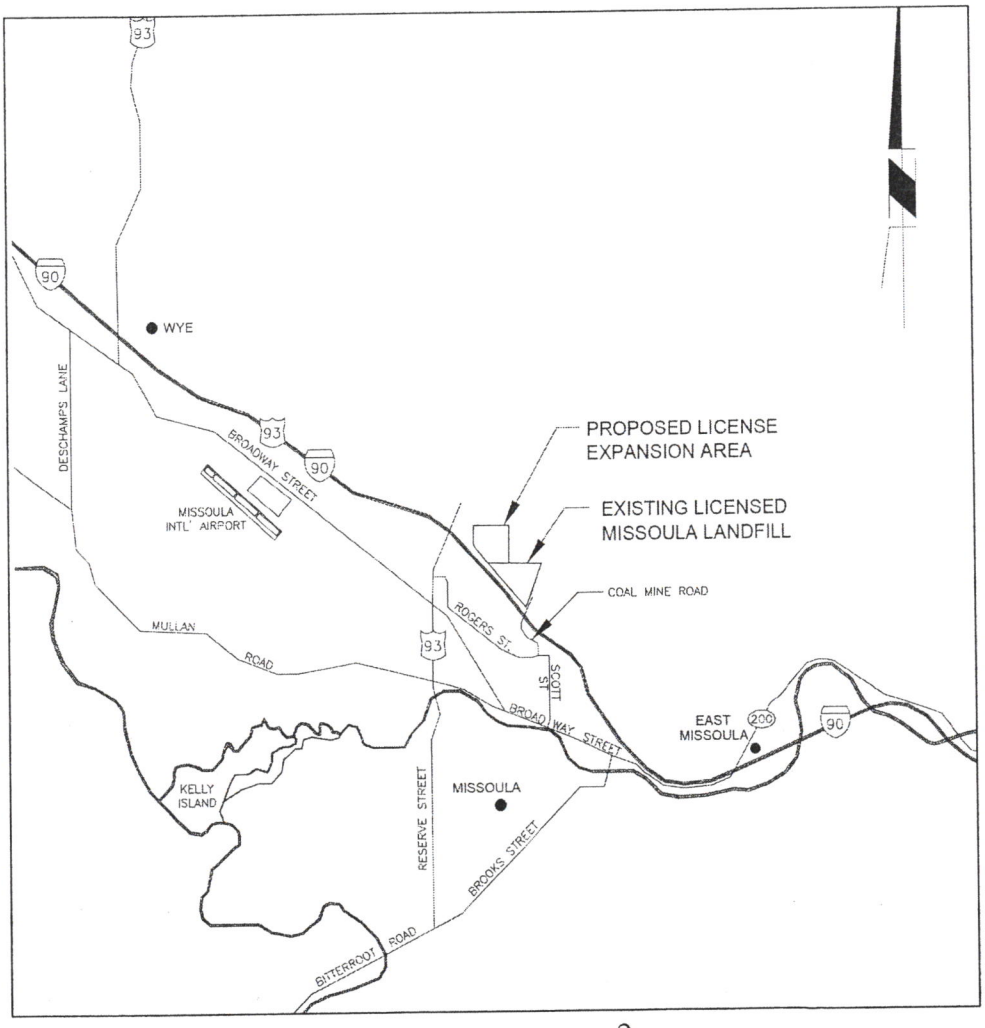
The AWSM landfill is currently open to both commercial haulers and the public with all waste management operations confined within the currently licensed 141-acre facility. In 2013, Republic Services, Inc. purchased the 447-acre parcel, formerly known as the Ryan Ranch Property, located to the north and northwest of the active landfill. Republic Services divided the parcel into a 303-acre conservation easement and the 144-acre proposed license expansion area.

Site Location:

The current AWSM Landfill facility is located approximately one mile northeast of the City of Missoula at 3737 Coal Mine Road in Missoula County, Montana (Figure 1.1). The proposed expansion area is located northwest of the current landfill in the southeast-quarter of Section 5, Township 13 North, Range 19 West, Montana Principal Meridian.

Figure 1.1: AWSM Landfill Proposed License Expansion Location

(From: SWT Engineering, Republic Missoula Landfill Expansion Application, 2013)



Site Geography – Topography, Vegetation, and Climate:

The AWSM Landfill facility is situated at the northwestern edge of the Middle Rocky Mountains Ecoregion on foothill uplands where the Garnet Mountains converge from the south with the northeastern edge of the Bitterroot-Missoula Valley. The bench terrain in the vicinity of the proposed expansion site consists of northeast trending ridges and valleys that were formed by erosion of the underlying sandstone and shale bedrock. Original ground surface elevations on the bench at the proposed expansion area range from 3,238 to 3,582 feet above mean sea level (amsl).

A site-specific resource investigation conducted in the proposed expansion area found current vegetation consisting predominantly of invasive, non-native plants and noxious weeds. This vegetation became established as the predominant cover over the site following a history of heavy livestock grazing.

The climate in the area lacks the strong maritime influence that is typical of more elevated areas in the mountains to the immediate north and west. The climate of the Missoula region is typical of the semi-arid, mid-continental regions, with long severe winters and hot summers. The average annual precipitation is 13.4 inches, average annual snowfall is 46 inches, while the average maximum temperature is 56°F and the average minimum annual temperature is 32°F (Table 1.1).

Table 1.1: Summary of historic climate data for the Missoula area

Missoula, Montana (727730)													
Period of Record Monthly Climate Summary													
Period of Record: 1948 - 1995													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (°F)	30	37	46	57	66	74	84	83	71	57	40	31	56
Average Min. Temperature (°F)	14	20	25	32	39	46	50	49	40	31	24	17	32
Average Total Precipitation (in)	1.2	0.8	0.9	1.0	1.8	1.8	1.0	1.0	1.1	0.8	0.9	1.1	13.4
Average Total Snowfall (in)	13	8	6	2	1	trace	0	0	trace	1	6	11	46

Landfill Design, Construction, Closure, and Post-Closure Care:

The proposed expansion area will be developed in five phases (Phase I through V) that will ultimately be tied together into a single landfill unit with a continuous final cover. The new waste disposal units in the expansion area will encompass a combined area of approximately 86 acres. The construction of the disposal units will progress downslope in the central coulee from the northeast to the southwest and will involve a base excavation and installation of the composite liner system and the leachate collection and removal system (LCRS) elements according to approved construction quality assurance and quality control plans.

The proposed landfill expansion design and operations will utilize several existing components of the active AWSM Landfill facility including: (i) the gatehouse and scale, (ii) landfill office building, (iii) methane flare station, (iv) hook-ups to leachate and condensate main pipe extensions, (v) facility access road, and (vi) controlled point of entry. The proposed expansion area will include (a) interior roads, (b) five phased waste disposal units, (c) groundwater monitoring wells, (d) leachate collection and removal system, (e) alternative final cover system, (f) storm water control system, and (g) methane collection and removal system.

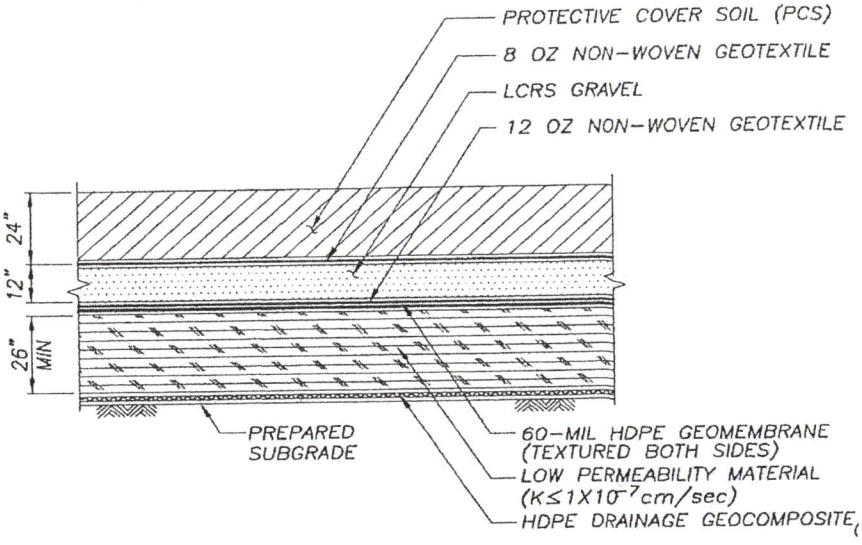
Liner Design and Alternative Liner Demonstration — According to ARM 17.50.1204, a new Class-II landfill unit must be designed to protect groundwater from landfill contaminants. This can be accomplished by meeting the design criteria prescribed by rule, or by submitting an alternative liner demonstration that shows the proposed liner is protective of groundwater. The prescribed landfill design consists of a standard composite liner that is made up of two components. The upper component of the liner must consist of a minimum 30-mil flexible membrane liner (FML); for an FML component that consists of high density polyethylene (HDPE), the HDPE must be at least 60-mil thick and must be installed in direct and uniform contact with the compacted soil component. The lower component of the liner must consist of at least a two-foot layer of compacted clay soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec. Hydraulic conductivity is a measure of the speed (rate or velocity) at which liquids flow through a material and depends upon how well the pores in the material are connected to transmit fluid. The hydraulic conductivity of the two-foot layer of compacted clay soil must be no more than $1.0x10^{-7}$ cm/sec; this means that any liquids passing through the clay liner would pass through at a rate of 0.0000001 cm/sec or 0.02069291 inches per year.

HDPE is a very low permeability synthetic membrane that is used to control fluid and/or gas migration in an engineered project, structure, or system (*e.g.* HDPE pipe is often used to convey water or wastewater for municipal systems). In landfill construction, HDPE geomembrane liner panels are welded into an impermeable barrier to prevent the contamination of soil and groundwater from chemicals in the waste.

The applicant's proposed design utilizes the standard composite base liner on the landfill floor (Figure 1.2) consisting of the following components from top to bottom:

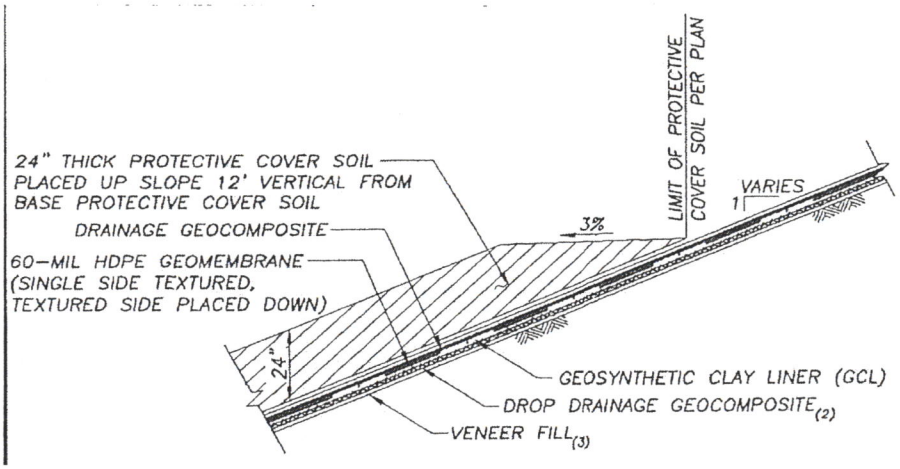
- 24-inches of protective cover soil
- 8-oz. non-woven geotextile separator
- LCRS gravel drainage layer
- 12-oz. Non-woven geotextile cushion
- 60-mil HDPE, double-sided textured geomembrane
- 24-inches minimum of compacted clay-rich material
- HDPE drainage geocomposite
- Prepared subgrade

Figure 1.2: Typical Base Liner Section
(From: SWT Engineering, Republic Missoula Landfill Expansion Application, 2013)



Because the applicant proposed an alternative composite liner design for the side slopes of the disposal units in the expansion area, an Alternative Liner Design Demonstration (Demonstration) is required in accordance with ARM 17.50.1204. The previously approved Demonstration (Russell, 10/20/2011 and DEQ, 1/9/2012) certifying compliance with the requirements of ARM 17.50.1204 was incorporated by reference into the proposed license expansion application documents. As depicted in Figure 1.3, the proposed side slope liner design incorporates an engineered geosynthetic clay liner (GCL) in place of the two-foot compacted clay layer (CCL). GCL is used primarily for lining landfills and is comprised of a layer of bentonite that is sandwiched between two layers of a woven felt-like fabric material. Bentonite is a clay that expands when wetted, so the GCL fabric material is stitched together to hold the bentonite in place.

Figure 1.3: Typical Alternative Slope Liner Design
(From: SWT Engineering, Republic Missoula Landfill Expansion Application, 2013)



The speed (rate or velocity) at which liquids can flow through the clay will depend upon how well the pores are connected to transmit fluid. This rate is expressed in terms of the saturated hydraulic conductivity. Although clay has a higher porosity than sand, the porosity in clay is due to the abundance of micropores, the openings between the individual clay particles (*i.e.* random micro-sheets stacked poorly like scattered dominos); the porosity in sand is attributed to the macropores, the large pores between the individual sand grains. Liquids move slower through the micropores in clay partly due to the surface tension on each individual clay particle. The clay particle holds on to the water molecule because it has a higher surface tension than a grain of sand. This surface tension and closure of micropores by swelling of the particle-like sheets during adsorption combine to decrease the saturated hydraulic conductivity for the clay, thus making bentonite a more effective barrier for retaining liquids inside the landfill. Therefore, the lower the hydraulic conductivity of the clay, the more effective the GCL will be at retaining liquids inside the landfill.

The saturated hydraulic conductivity of the manufactured GCL proposed for use on the side slopes is approximately 1.0×10^{-9} cm/sec on average; this value is 100 times lower than the value required for the lower CCL component proposed for the composite base liner (1.0×10^{-7} cm/sec). With an effective porosity of 0.6, as noted in the AWSM Landfill's approved 2011 Demonstration, any liquids seeping through the GCL would migrate at a rate of [(1/0.60) x 0.000000001] cm/sec or 0.00034 inches per year; 0.00517 inches over 15 years; 0.01034 inches over 30 years.

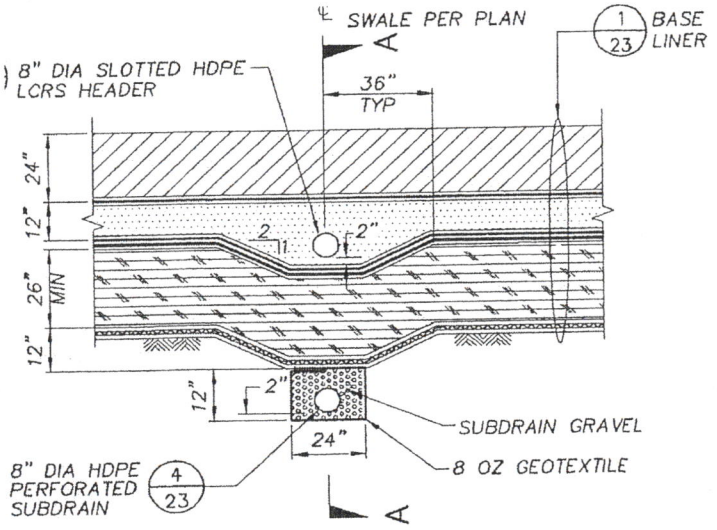
An optional veneer of selected granular material may be installed over the subgrade before placement of the GCL to minimize thinning and to protect it from excessive hydration or dessication. In addition, where natural seepage of perched groundwater intercepts the slope liner, a subdrain system will be installed to convey the perched water to discharge downslope from the landfill unit.

The slope liner system, subdrain, and associated LCRS elements (Figure 1.4) consist of the following components listed from top to bottom:

- 24-inches of protective cover soil;
- HDPE drainage geocomposite (LCRS blanket);
- 60-mil HDPE, single-sided textured geomembrane;
- GCL;
- HDPE drainage geocomposite (locations to be specified by the site engineer as needed); and,
- Veneer fill (to be placed where specified by site engineer).

Leachate Collection and Removal System — The LCRS design will provide two configurations to account for the difference in base and slope liner stability as listed in the liner profiles described above. For the waste disposal unit base, the granular leachate collection layer will be constructed with a two-percent slope to convey leachate from the outer edge of the floor towards a central trench containing a perforated 8-in HDPE leachate collection main. This LCRS main will follow the existing coulee axis to the landfill toe and will slope at a minimum of one percent. The main will be joined on 200-ft centers by 6-in slotted HDPE collection laterals that are spaced for adequate leachate removal throughout the collection layer. Solid 6-in HDPE risers will be installed on the slopes to provide cleanouts for this lateral pipe. A geotextile cushion will be installed under all piping to protect the HDPE geomembrane liner from potential abrasion. In addition, a non-woven geotextile filter fabric will be installed above the granular leachate layer to prevent clogging from the downward filtration of fines during migration of leachate from the overlying waste.

Figure 1.4: Typical Subdrain and LCRS Header Design



On the side slopes of the waste disposal units, the LCRS design consists of a geocomposite drainage net placed over a geotextile cushion on top of the smooth geomembrane slope. Leachate from the side slopes will be directed downslope by gravity drainage through the geocomposite drainage net into the base LCRS network. All leachate will be directed to temporary leachate collection tanks during Phase I, II, and III operations. During construction of

the Phase IV waste disposal unit, the stability toe berm will be completed and the permanent leachate collection sump will be installed. Two 12-inch solid HDPE leachate removal and monitoring risers will then be installed along the interior slope from the sump floor to the lip of the berm. Leachate depths will be monitored at the sump and pumped as necessary to a dedicated pump control station. Pumped leachate will then flow by gravity into the force main currently utilized by the AWSM Landfill facility. This main is currently connected to the existing city sewer pipe system for treatment by the Missoula Wastewater Treatment Plant.

Scale and Office Building — The scale and office building used for current operations at the active AWSM Landfill facility will continue to be used when the proposed expansion area is developed. The scale and office building are located at the entrance to the active AWSM Landfill facility on the southeast corner of the site.

Waste Disposal Capacity — The proposed expansion area will be developed in five phases and will expand the AWSM Landfill footprint by 86 acres, providing for the disposal of an estimated at 15,700,000 cubic yards of waste. Based upon the waste density, the waste acceptance rate, and the projected growth rate in the Missoula valley, the proposed expansion area will have a site life of approximately 45.3 years.

Soils Excavation and Budget — Excavation for construction of the landfill in the expansion area will progress in five phases. The proposed expansion is designed for the placement of composite liner system over 86 acres after the excavation of the soil and rock from the coulee and slopes. Approximately 3,353,322 cubic yards of excavated soil will be used for daily cover, final cover, and liners, leaving a net soil surplus of approximately 352,778 cubic yards.

Soil Borrow Areas and Stockpiles — The soil removed as each waste disposal unit is excavated for construction will either be stockpiled in future waste disposal unit areas, or will be placed on top of fill in available active or closed landfill cells. Accessible stockpiled soil can be utilized for daily or intermediate cover operations when needed, or placed for use during final cover construction within any waste management area that has reached final grade. Table 1.2 summarizes variations in fill and soil volumes required during each phase of operations within the Phase 2 expansion area, as well as total soil available on site.

Runoff from soil stockpiles will be managed using best management practices (BMP's), including erosion control mats, screens, wattles, or berms. Such use will also control erosion from stockpiles located outside the waste disposal units. All runoff from these stockpiles will be routed to the storm water pond, but effective erosion control BMP's (e.g., revegetation) may allow clean runoff from these areas to also be routed to the central coulee and naturally discharged offsite.

Table 1.2: Landfill design volume and excavated soil budget.
(Source: SWT Engineering, Republic Missoula Landfill Expansion Application, 2013)

Phase	Gross Airspace CY [1]	Bottom Liner CY [2]	Slope Liner CY [3]	Final Cover CY [4]	Net Airspace CY [6]	Daily Cover CY [5]	Total Soil Required CY	On-Site Soil Available CY	On-Site Soil Remaining CY
I	1,808,500	56,551	33,510	44,300	1,718,439	229,125	363,486	527,300	163,814
II	1,759,200	21,012	33,148	20,450	1,705,040	227,339	301,949	1,046,500	908,365
III	1,931,300	39,522	23,524	43,650	1,868,254	249,101	355,797	347,700	900,269
IV	4,499,600	20,397	32,012	104,600	4,447,191	592,959	749,968	1,209,500	1,359,801
V	8,486,100	0	67,665	392,000	8,418,435	1,122,458	1,582,123	575,100	352,778
Total	**18,484,700**	**137,482**	**189,859**	**605,000**	**18,157,359**	**2,420,981**	**3,353,322**	**3,706,100**	**352,778**

(1) Total volume between excavation and refuse fill plans.
(2) Bottom Liner - 3.0' thick (vertical height)
(3) Slope Liner - 2.0' thick (vertical height)
(4) Slope and Deck Final Cover - 4.0' thick (vertical height)
(5) 6.5:1 Refuse to Daily Cover Soil Ratio
(6) Final cover is not subtracted from net airspace but as an additional 4.0' thick cover above airspace grades.
(7) Licensed portion of Landfill volumes are based on licensed master fill plan as compared to 2011 topo.

Groundwater Monitoring System — The groundwater-monitoring program for the proposed expansion area will be incorporated into the current groundwater-monitoring program at the existing AWSM Landfill facility. The proposed groundwater monitoring network includes the addition of five monitoring wells located at the relevant point of compliance (RPOC) in the expansion area (Figure 1.5). The RPOC wells are monitored to ensure that the liner and leachate collection systems function as designed and do not result in a release of contaminants to groundwater.

The groundwater monitoring wells installed during characterization of the proposed expansion area include upgradient RPOC well B-21 to the north and downgradient RPOC wells B-22, B-23, and B-24 to the south. Well B-24 encountered water in 2011 when it was first drilled, but was dry when monitored in 2012 and 2013. This well will remain in the monitoring network, but an additional deeper well (B-25) will be installed adjacent to B-24 to intercept uppermost groundwater adjacent to the coulee outlet and the Missoula Valley aquifer. Prior to construction of the first waste disposal unit in the proposed expansion area, additional monitoring wells will be installed to fill in the downgradient network along the northwest (well B-27) and southeast (B-26) expansion area boundary.

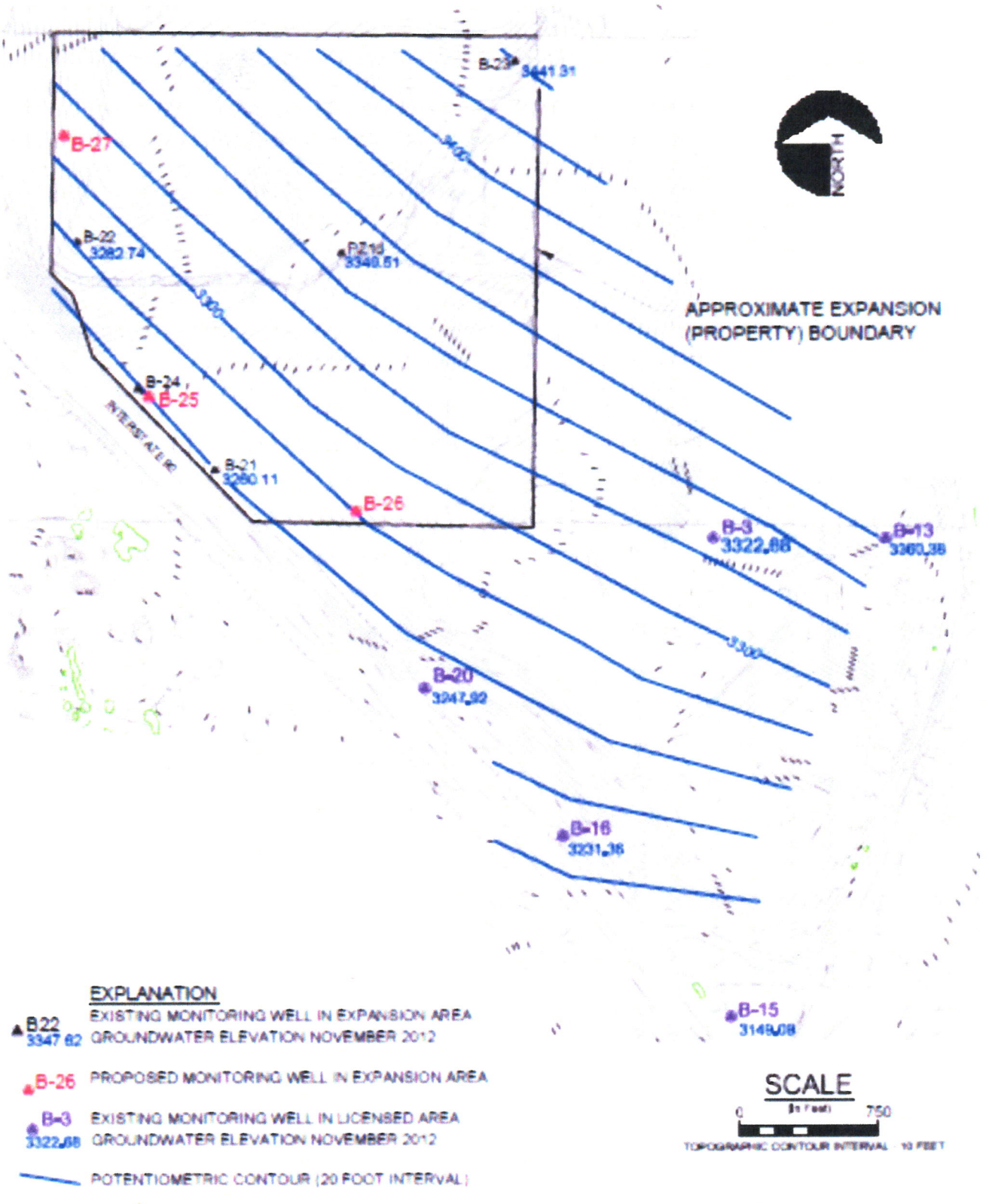
Detection monitoring will include field and laboratory measurements and analyses, with data acquired and analyzed according to an updated and approved Groundwater Monitoring Sampling and Analysis Plan (SAP). Groundwater elevations will be measured at each well immediately prior to purging, and at all wells in the network within a short period of time (typically on the same day) during each sampling event to avoid temporal variations in groundwater flow. Analytical parameters for the proposed detection monitoring program will include all current constituents as required by the updated and approved SAP.

Quarterly monitoring (four samples/year) for at least one year will be performed to establish the baseline groundwater quality prior to placement of waste in the proposed expansion area landfill unit. This monitoring frequency will provide four independent samples as required during the first year to characterize seasonal variations in site groundwater quality. After background water quality is established and waste is placed in the expansion area landfill unit, all wells in the detection monitoring network will be monitored on a semi-annually basis for all required parameters during the life of the facility.

Landfill Gas Control and Methane Monitoring Systems — Methane monitoring wells will be installed near the boundary of each waste management unit as each phase of the landfill is developed. These wells will be monitored quarterly to assure that standards for lateral migration of methane gas are not exceeded at the boundary. As the expansion area is developed, a series of landfill gas monitoring wells will be installed to surround the waste disposal unit footprint at locations and depths approved by DEQ prior to construction of each waste unit. Methane levels will be monitored on a quarterly basis to ensure the concentration of methane gas generated by the facility does not exceed 25-percent of the lower explosive limit (LEL) for methane in facility stuctures, or the LEL for methane at the facility property boundary. Any exceedence of these specified levels of methane in the soil will be immediately reported to the DEQ followed by the submittal of a landfill gas remediation plan for DEQ approval.

Methane is currently pumped from 58 vertical landfill gas extraction wells at the current AWSM Landfill facility. The landfill gas is conveyed through headers and lateral piping to an existing flare station located at the active landfill facility. A separate landfill gas extraction system will be designed, installed and operated for the proposed expansion area as the waste disposal units in the expansion area reach capacity. The vertical extraction wells and horizontal collectors completed within the waste disposal units will be connected to a looped landfill gas extraction system installed around the perimeter of the landfill. The flare station operations will remain at the active AWSM Landfill facility.

Figure 1.5: Location of expansion area groundwater monitoring wells
(Source: SWT Engineering, Republic Missoula Landfill Expansion Application, 2013)



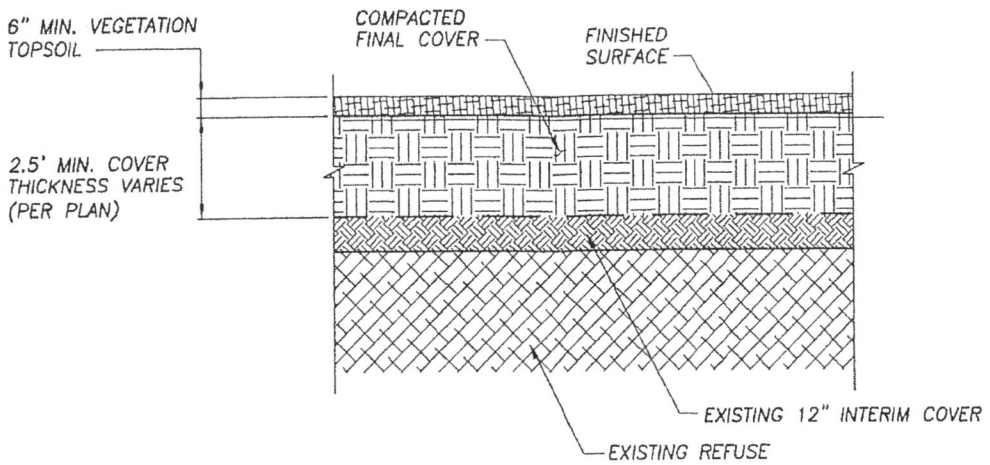
Final Closure — Once all of the five waste disposal units have been filled to grade, the intermediate soil cover over the units will be tied together and capped as a single, mounded disposal unit by a continuous final cover.

The applicant proposes to utilize the alternative final cover (AFC) system that has been approved for closure of the active AWSM Landfill facility as the cap design for closure of the expansion area waste units. The proposed AFC is designed to provide an engineered soil-plant system that will attain the soil equilibrium reached in the surrounding ecosystem. In the surrounding ecosystem, optimal vegetative growth is supported by natural soil storage of the yearly precipitation. Water retention in the soil cover will approach a balance of storage and drainage performance which allows a maximum 3 mm/year (0.118 inch/year) average annual drainage through the cover. Likewise, all of the proposed AFC features (thickness, range of soil properties, native plant species) conform with the full-scale AFC test plot that was installed to monitor field drainage adjacent to the proposed expansion area landfill footprint.

The 4-feet thick, monolithic AFC profile (Figure 1.6) for the expansion area landfill will consist of the following field-tested components, from top to bottom:

- Healthy stand of select native local vegetation
- Minimum 6-inch thick topsoil layer;
- Minimum 30-inch thick storage layer of select tested and approved soil; and,
- Minimum 12-inch thick pre-existing intermediate or approved mixed soil cover.

Figure 1.6: Typical AFC Profile Design
(From: SWT Engineering, Republic Missoula Landfill Expansion Application, 2013)



Alternative Final Cover (AFC) Demonstration — The expansion Closure and Post-Closure Plan incorporates by reference the approved AFC demonstration so that the predicted 3 mm/yr drainage would satisfy requirements for AFC equivalence to the standard composite final cover. Consequently, DEQ also approved the parallel expansion proposals involving: (i) the original AFC design, and (ii) the proposed site-specific 3 mm/year maximum AFC drainage standard. The AFC field monitoring has completed three consecutive years of favorable performance with actual drainage consistently falling below the 3 mm/yr standard on average.

During the three-year monitoring window, the various on-site data obtained were evaluated, including temperature, precipitation, wind speed, soil moisture profile, volume of water drained from base, and volume of runoff. The reports and graphical data summaries from the AFC test plot established that the monolithic water balance final cover will perform within a range better than the site-specific 3-mm/year maximum drainage standard as proposed.

Post-Closure Care – The final cover will be monitored periodically for drainage performance, erosion, and vegetative cover to ensure successful performance of the cap through the 30-year post-closure care period. Repairs to the cap will be made as necessary.

Landfill Operations:
The AWSM Landfill facility will continue to operate as a private landfill and follow an approved Operations and Maintenance (O&M) Plan that describes the necessary procedures for all solid waste management activities. The facility O&M Plan will be updated, as necessary, prior to commencing operations in the proposed expansion area and as on-site conditions change.

Personnel — The proposed expansion area will continue to be operated by 10 to 12 full-time employees. Additional personnel will be added as needed. Site personnel will inspect incoming loads, review incoming waste load records, operate landfill equipment, and apply the necessary soil cover.

Operating Hours — The current AWSM Landfill is open to commercial haulers from 6:30 a.m. and 5:00 p.m., seven days per week, and to the general public from 8:00 a.m. to 4:30 p.m., seven days per week. These operating hours will be maintained and the site will continue to be open to commercial haulers and the general public when facility operations transition into proposed expansion area. The landfill operates 322 days yearly, but the weekly schedule is interrupted by closure on Christmas Day and New Year's Day.

Access Control – Security fences will be extended around the expansion site and will limit landfill access by unauthorized persons. All landfill users enter the expansion area through the main facility gate. Scale house personnel will continue to control all access through this existing landfill entrance.

Acceptable Wastes — The proposed expansion area will be licensed as a Class II facility and continue to accept Group II, III, and IV wastes, as is the current practice at the existing AWSM landfill. Group II wastes include decomposable wastes and mixed solid wastes containing decomposable materials, but exclude regulated hazardous waste. Group III wastes include wood wastes and other clean non-water soluble or inert solids. This category includes, but is not limited to, brick, rock, dirt, concrete, unpainted and unglued wood materials, and tires. Group IV wastes include construction and demolition wastes and asphalt, but exclude regulated hazardous wastes. All incoming solid wastes will be commingled and placed in the Class II landfill.

Waste Screening — The landfill staff will continue to perform random load inspections to assure landfill compliance with regulations prohibiting the disposal of regulated hazardous waste and polychlorinated-biphenyls (PCB) in solid waste landfills. At the gatehouse, the landfill operator will monitor each load of incoming wastes. If unacceptable wastes are discovered at the gatehouse, the facility will reject the load and instruct the customer to dispose of it at an appropriate facility. Any unacceptable waste discovered by the equipment operators at the working face will be segregated in the waste disposal unit for handling and disposal by a qualified consultant. The facility operator will notify SWP within 24-hours when prohibited wastes are discovered at the facility or incoming loads are rejected during the on-site waste screening activities.

Special Waste Handling — The AWSM landfill will continue to accept dead animals for disposal. Dead animals disposed of at the landfill working face will be off-loaded and placed within the daily refuse as soon as possible. As is the current practice, refuse will then be placed over the animal and compacted with the rest of waste in the disposal unit.

Waste loads containing friable asbestos will continue to be off loaded and inspected for proper packaging and labeling. The material will then be placed in the proper disposal area and immediately covered. Signage will be posted identifying the asbestos waste disposal area. The facility will continue to maintain a map that documents where friable asbestos is disposed, including coordinates, depth, quantity, and any other DEQ required tracking procedures. The landfill personnel will continue to be properly trained to recognize asbestos wastes.

Household medical sharps will continue to be accepted at the proposed expansion area for proper and safe disposal. At the present time, sharps are collected at the applicant's hauling facility located on Rodgers Street. When sharps containers are full and the landfill is closed to the public, the container will be hauled to the active waste disposal area for proper and safe disposal. The material will be dumped in a hole near the active working face and then covered as required.

Daily Landfill Operations — Trained landfill personnel will direct vehicles to the unloading area and maintain control over the area used for discharging wastes. Shipments of waste that require particular handling would be directed to their respective disposal areas. Shipments of special waste with unique disposal requirements, such as friable asbestos or dead animals, would also be directed to their respective disposal areas. The public will not be allowed on the landfill tipping deck and instead directed to a public drop-off area, where they unload their waste into roll-off containers, which are emptied on a daily basis. White goods and metals will be unloaded at a separate drop-box container before they are moved to the tipping area.

As refuse is being unloaded at the containers or working face, landfill staff will inspect the loads for recyclable or prohibited materials. Unacceptable waste identified by landfill staff is separated for proper treatment and disposal, or rejected and returned to the customer. As appropriate, customers with recyclable or salvageable materials are directed to a licensed off-site recycling facility.

Litter Control — Wastes will continue to be compacted and covered as required in the active waste disposal unit as soon as possible after deposition to reduce the possibility of blowing litter. Whenever possible, the active working face will be oriented to the downwind side of prevailing winds and kept to the smallest practical area to minimize exposure and help reduce litter. Landfill personnel will continue to regularly patrol the landfill perimeter and pick up litter blown from the working face on a routine basis. Additionally, portable litter fences may be placed downwind of the working face. Litter caught on the fences is removed daily or as necessary. All loads require tarps placed over open truck loads.

Severe Weather Operation — All-weather roads will continue to be constructed within the facility boundary to ensure that facility operations are not hindered during inclement weather. The location of the public drop-off area may be adjusted as necessary during muddy conditions. During windy weather, the operators will utilize temporary litter fences to catch blowing debris. The working face may also be moved to lower elevations, or operations may be shut down temporarily during extremely windy conditions.

Leachate Control — Leachate will be captured in the leachate collection system and drain along the central swale through the main pipe to the central sump at the toe behind the stability berm. Prior to the construction of the Phase IV landfill unit in the expansion area, leachate will drain by gravity from the main pipe through a central liner penetration where it will then be conveyed through a double-walled pipe to a temporary double-walled leachate storage tank. Leachate levels in the temporary storage tank will be regularly monitored for pumping and removal of the

leachate into a tank truck for delivery and offsite treatment by the Missoula wastewater treatment works. After completion of the toe berm and sump, leachate levels in the collection sump would be regularly monitored to maintain less than 12 inches of depth over the liner. A leachate removal pump will be installed into the lower perforated segment of the south-slope HDPE riser pipe to remove the leachate accumulated in the sump before it exceeds the maximum depth allowed. Leachate will flow to the pump station for discharge into the on-site force main connection and offsite treatment at the Missoula wastewater treatment works. Regular sampling of the leachate for lab testing will document variations in the level of constituents and ensure compliance with the provisions of the wastewater permit.

Storm water control —Best Management Practices (BMP's) that include gravel armor, fiber matte, straw bales, vegetation, road culverts, triblock and other similar features, in conjunction with the ditches, swales, berms, and the storm water retention pond will continue to be used in the expansion area to control and contain storm water run-on and run-off. During the operation of the Phase I through III waste disposal units in the expansion area, the storm water collected on the upslope areas of open liner (initially covered by scrim reinforced tarps) that does not contact waste, and runoff from intermediate cover areas on interim slopes in the active waste disposal units, will be routed to a temporary storm water detention pond. Later, during operation of Phases IV and V waste disposal units in the expansion area, all runoff from the landfill facility will be routed to the permanent southerly sedimentation basin adjacent to the toe berm. The storm water retention pond is designed to contain a surge of storm water generated from a 100-year, 24-hour storm event, retain the suspended sediments that would otherwise be contained in storm water runoff, and then if necessary, discharge via the controlled slow release of the collected water to minimize the downstream impact of storm-induced flooding. Prior to any discharge event, the necessary discharge permits will be obtained from the DEQ's Water Protection Bureau (WPB).

The locations of the temporary berms in the active waste disposal units will be adjusted as filling in the unit progresses to detain leachate and separate storm water for removal. Storm water that contacts waste is considered leachate; all leachate will be captured by the leachate collection system for gravity drainage to the leachate storage tank.

Additional BMP's, including the rapid establishment and maintenance of vegetation on closed areas and on the soil stockpiles in the expansion area, will be implemented as necessary. Areas receiving final cover will be contoured for positive drainage so that surface runoff will be routed away from the active disposal area.

The AWSM Landfill facility personnel will continue to monitor and inspect the condition and order of facilities, surfaces, and slopes as part of the normal landfill operations. Surface drainage facilities, final soil cover areas, intermediate fill surfaces, and on-site access roads will be observed routinely, and at least weekly during high-intensity rainfall periods. All necessary repairs will be performed promptly. Temporary berms, straw mulch, or other erosion-control measures may be used to prevent erosion damage of soil covered areas when weather conditions inhibit complete repairs. A cover may be placed over all waste management unit lifts, cut and fill slopes, and portions of the landfill that will be exposed for more than 180 days to minimize erosion and downstream sedimentation.

The effectiveness of the surface drainage control structures will be maintained by keeping drainage ditches clear of debris and excessive vegetation and by making repairs, as necessary, to correct the effects of physical damage, erosion, settlement, or other events detrimental to effective operation of the drainage control system. Corrective measures will be implemented if

inspections reveal excessive erosion or damage to the drainage channels or if settlement causes ponding of runoff on intermediate or final cover. Eroded areas will require removal of the affected loose material followed by replacement and regrading of the area to match the adjacent surface contours. If ponding is observed in a channel over the final cover, the channel will be regraded to permit proper drainage of runoff. Inspections and maintenance of the drainage system will be carried out at a minimum of quarterly and after large precipitation events according to the facility Storm Water Pollution Prevention Plan (SWPPP). The active AWSM Landfill facility currently maintains a General Industrial Stormwater Discharge permit as required by the WPB for Class-II landfill facilities that have the potential to discharge into state waters.

Contingency Planning — The O&M Plan for the active AWSM Landfill facility has current contingency plans for unusual situations beyond typical screening procedures. The expanded facility will follow similar updated detailed response plans for fire protection and notifications during emergencies. The O&M Plan is reviewed at least every five years and updated as necessary for DEQ review and approval.

Financial Assurance:

In accordance with ARM 17.50.540, all Class II landfills must provide and maintain a Financial Assurance (FA) mechanism to cover costs associated with facility closure and post-closure care. The FA ensures that work associated with facility closure or post-closure care is completed in the event the operator or owner cannot or will not do so on their own accord. The current approved FA mechanism for the active AWSM Landfill facility consists of performance bonds. The DEQ will remain the beneficiary, and will control all release of bond obligations. The facility will update the FA cost estimates and penal sum for each bond on an annual basis (including inflation) to ensure that the total level of bonding remains adequate to meet all FA obligations. The amount of FA required is based upon the proposed maximum costs associated with third-party closure of the maximum exposed landfill area and post-closure care. The current total cost for FA is $7,537,225, and includes projected closure costs of $4,936,430 and the costs for post-closure care of $2,600,795.

SECTION 2.0 – ALTERNATIVES CONSIDERED:

The following provides a description of reasonable alternatives whenever alternatives are reasonably available and prudent to consider:
A decision by DEQ is triggered when the applicant upholds the request for licensure of the proposed activity at the proposed location. The applicants however, may at any time choose to withdraw the application. This would result in DEQ selecting the "no action" alternative, because a DEQ decision would not be necessary. If the applicant withdraws the application, the applicant could seek to locate a similar facility elsewhere.

Alternative A: The "no action" alternative. If this alternative is selected, a final decision by DEQ will not be required because the applicant will have chosen to withdraw the application for licensure of the landfill. By withdrawing the application from consideration by DEQ, the applicant could seek an alternative site for the proposal.

DEQ has not received a request by the applicant to withdraw the application for licensure. Therefore, prior to DEQ's final decision, two other possible alternatives were considered during the preparation of this EA.

Alternative B: The "license application denied" alternative. If this alternative is selected, DEQ will deny the new landfill application because the application failed to meet the minimum requirements of the Solid Waste Management Act and could not continue to be processed as submitted. If denied, the applicant has the option to locate, investigate, and apply for licensure of another site.

Alternative C: The "license application approved" alternative. If this alternative is selected, DEQ will approve the application and issue a new license expanding AWSM, Missoula Class II Landfill facility.

In consideration of these alternatives, the potential environmental effects of Alternative C were evaluated for the proposed project based on the information provided, DEQ research on the site and area surrounding the proposed site, and DEQ's site visit. The results of DEQ's evaluation of potential environmental impacts related to the proposed facility expansion are summarized in Section 3.0.

SECTION 3.0 — EVALUATION OF POTENTIAL EFFECTS

Tables 3.1 and 3.4 of this section identify and evaluate the potential effects that may occur to human health and the environment if the proposed expansion application is approved and the AWSM Landfill facility continues to operate for another 45 years in the expansion area. The discussion of the potential impacts only includes those resources potentially affected. If there is no effect on a resource, it may not be mentioned in the appendix.

Direct and indirect impacts are those that occur in or near the proposed project area and may extend over time. Often, the distinction between direct and indirect effects is difficult to define and for the purposes of this discussion, direct and indirect impacts are combined.

TABLE 3.1 - IMPACTS TO THE PHYSICAL ENVIRONMENT

PHYSICAL ENVIRONMENT	Major	Moderate	Minor	None	Unknown	Attached
1. Terrestrial and Aquatic Life and Habitats			✔			✔
2. Water Quality, Quantity, and Distribution			✔			✔
3. Geology			✔			✔
4. Soil Quality, Stability, and Moisture			✔			✔
5. Vegetation Cover, Quantity, and Quality			✔			✔
6. Aesthetics				✔		
7. Air Quality			✔			✔
8. Unique, Endangered, Fragile, or Limited Environmental Resources				✔		
9. Historical and Archaeological Sites				✔		
10. Demands on Environmental Resources on Land, Water, Air or Energy				✔		

ANALYSIS OF TABLE 3.1 – POTENTIAL IMPACTS TO THE PHYSICAL ENVIRONMENT

This section evaluates the potential environmental effects that may occur on the physical environment if the proposed facility is approved. The number on each of the underlined resource headings corresponds to a resource listed in the tables. Generally, only those resources potentially affected by the proposal are discussed. Therefore, if there is no effect on a resource, it may not be discussed.

1.0 Terrestrial and Aquatic Life and Habitats

The AWSM Landfill facility is situated on foothill uplands at the northwestern edge of the Middle Rocky Mountains Ecoregion where the Garnet Mountains converge from the south with the northeastern edge of the Bitterroot-Missoula Valley. These foothills are transitional features between the adjacent mountain highlands subregion on the north and the intermontane Missoula Valley subregion to the south. In the foothill transition zone, there is some overlap of these two ecological communities.

The primary impact anticipated due to the construction and operation of the expansion area will be the displacement of terrestrial species. However, most displacement from habitat has largely already resulted from past and ongoing operations at the adjacent active AWSM Landfill and previous livestock grazing activities in the proposed expansion area. The impacts of landfill construction and operation on terrestrial species that occupy the local foothills will likely be minor due to previous degradation of the expansion area from ranching and the abundance of surrounding similar habitat.

Republic Services conducted a biological resources investigation (Hydrometrics, 2013) to assess the proposed expansion area for the presence of jurisdictional waters of United States, plant and animal species of conservation concern that may be present on the site, and ecological conditions that characterize the site. Information for the resource investigation was obtained from a site survey conducted on July 21, 2012, a review of aerial imagery, queries of the Montana Natural Heritage database, and a review of scientific literature. The information presented on site specific observations herein was taken directly from the Hydrometrics report.

Based on a search of the Montana Natural Heritage Program database, the Hydrometrics, 2013 biological resources investigation report listed the animal records of all possible endangered, threatened, or species of concern. Little natural habitat (<1%) was found during a field survey of the applicant's properties. Consequently, the discussion was limited to the following species, with no potential for impact to threatened species that are listed below for reference (Table 3.2). Only two threatened species were listed for the square mile surrounding the site. Designation as a species of concern is not a statutory or regulatory classification. Instead, these designations provide a basis for resource managers and decision-makers to make proactive decisions regarding species conservation.

Common mammal species observed or likely to be present on the site include white-tailed deer, coyote, striped skunk, red fox, badger, Columbian ground squirrel, deer mice, and meadow voles. Elk and black bear are likely periodic visitors to the area. Although sparse in the foothills area as a group, some individuals may become habituated to human development and food attractants (*e.g.* black bear, white-tailed deer, and striped skunk).

Based on the limited habitat features observed during the biological survey of the proposed expansion site, it would be very unlikely for any of the species protected under the Endangered Species Act, or listed as threatened, to habitate or pass through the proposed project area. Only two species of concern, the bald eagle and gray wolf, are even likely to periodically visit the expansion site. Bald eagles are winter residents and nest and forage along the nearby Clark Fork River, thus they could periodically fly over the project area while foraging. The bald eagle was removed from the federal protection under the Endangered Species Act. After delisting, bald eagles have special status under the Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act. These acts prohibit the killing or otherwise harming of bald eagles, their nests, or their eggs.

Table 3.2: Local threatened and likely species of concern - AWSM Expansion Area
(From: Hydrometrics, Inc., Biological Resources Investigation Report, 2013)

Species Subgroup	Scientific Name (Family)	Common Name (Special or local status)	Habitat Association
Mammal (Mammalia)	*Canis lupus*	**Gray wolf** (unlikely but possible transient)	Forest and shrubland habitats with adequate prey base of big game animals present.
Mammal (Mammalia)	*Ursus arctos*	**Grizzly bear** (very unlikely)	Remote forest habitats with low road density and minimal human disturbance.
Mammal (Mammalia)	*Lynx canadensis*	**Canada lynx** (Threatened & very unlikely)	Boreal forest habitat, with large woody debris, and suitable habitat for primary prey (snowshoe hare) present (usually above 4,000 feet elevation).
Bird (Aves)	*Haliaeetus luecocephalus*	**Bald eagle** (Special status & unlikely but possible transient)	Nesting and perching trees near water with primary prey species (fish and waterfowl) present
Fish (Actinopterygii)	*Salvalinus confluentus*	**Bull trout** (Threatened & no rivers/streams on site)	Major rivers and tributary Streams
Fish (Actinopterygii)	*Thymallus arcticus*	**Arctic grayling** (no lakes/streams on site)	Cold lakes and streams

Key components of viable wolf habitat are not available in the existing expansion site or surrounding areas in the foothills on the bench immediately adjacent to Missoula: wolves require (i) a sufficient year-round prey base of deer, elk, moose, and other alternative prey; (ii) suitable and somewhat secluded denning and rendezvous sites; and (iii) sufficient space with minimum exposure to humans. Potential ungulate prey, like elk and whitetail deer grazing within the proposed expansion area, may be attractive to wolves. Although wolf sightings are widely reported throughout western Montana, they have not been documented within the proposed expansion area or adjacent foothills. Yet wandering individuals could possibly pass through as transients dispersing from packs in the surrounding mountains. The south-facing slopes of the foothills bordering the northern Missoula Valley are winter range for mule deer and elk. But the attraction for wolves to weak prey individuals is minimized by the almost total displacement of native grasses by noxious weeds (see Section 5 below) which greatly reduce the capacity of the expansion parcel and surrounding areas to support a large population of these prey species. The gray wolf was removed from the federal protection under the Endangered Species Act.

Loss of the 144-acre expansion area as wildlife habitat would not be critical, because it is not a unique or rare wildlife environment when the tract is currently dominated by degraded rangeland as noted. Due to lack of development in the adjacent areas to the north and east of the proposed site, there is probably adequate acreage of similar habitat available in the vicinity to accommodate any terrestrial or avian species that may be forced to relocate. Further, continued

compliance with good operational practices in the expansion area, including daily and intermediate cover, will not change the currently minimal levels of scavenging gulls, crows, ravens, or birds of prey. The attraction of nuisance insects and disease vectors, such as mosquitoes and flies will likewise be minimized.

A similar habitat (303 acres) is conserved in perpetuity by the adjacent easement parcel (Table 3.3 – Parcel 2) and could accommodate mobile terrestrial species that may be forced to relocate from the proposed expansion area (144 acres). After closure, the proposed expansion area will be re-seeded to native plant species typical of the surrounding grassland habitat. Some mobile terrestrial species could then re-populate the area after facility closure.

As a positive change following construction, lacustrine and riparian habitats may periodically develop as runoff is routed to the storm water detention pond. Attracted aquatic species, such as frogs or salamanders, or waterfowl could temporarily utilize these pond habitats. Evaporation of the storm water pond during dry periods would then force these species to relocate as the pond dries up. The limited wetlands habitat located on the adjacent conservation easement (as discussed below) would provide one possibility for support of aquatic species relocation due to their temporary occupation of the pond.

Table 3.3: Summary of Republic Services/AWSM land ownership
(Source: SWT Engineering, Republic Missoula Landfill Expansion Application, 2013)

Description	APN Number	Township/ Range/Section	Legal Description	Approximate Lot Size (Acres)
Existing Licensed Landfill Area	1705905	T-13N/ R-19W/ S-08	NE1/4 8-13-19	141
	1706005	T-13N/ R-19W/ S-09	W1/2 NW1/4, PT E1/2 NW1/4, PT NE1/4 SW1/4 9-13-19	
Parcel 1 - Proposed License Expansion Area	1975700	T-13N/ R-19W/ S-05	N1/2, SW1/4SE1/4, SW1/4 SE1/4 N OF HWY PLAT B	144
Parcel 2 - Conservation Easement	1975806	T-13N/ R-19W/ S-04	N1/2 PLAT D	303

The determination for field assessment of potential on-site wetlands followed the methodology as outlined by the U.S. Army Corps of Engineers: (1) Wetlands Delineation Manual (Environmental Laboratory 1987); and (2) Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Environmental Laboratory 2008). The area must show hydrophytic vegetation, hydric soils, and wetland hydrology to satisfy the criteria for jurisdictional wetlands regulated under the Section 404 of the federal Clean Water Act.

The on-site field studies found no wetlands or other waters of the United States within the expansion area, but identified a small wetland associated with a spring adjacent to the residence beyond the northeast corner outside of the proposed expansion area. This isolated wetland lies

within the dry coulee northeast of the proposed expansion area. However, flow from the spring and wetland does not reach the project area via dry coulee.

Potential additional impacts to terrestrial and aquatic life are expected to be minor, as there are no wetlands or riparian zones and established prime or sensitive terrestrial habitat within the expansion area.

2.0 Water Quality, Quantity, and Distribution

Surface Water — Surface water runoff is the natural flow of water discharged when the excess water generated by rain or snowfall, melting of accumulated snow, or seepage from groundwater springs flows freely over the land surface. This overland flow will occur over bare rock or ice, when the soil is saturated and ponding capacity exceeded, when precipitation falls more quickly than the soil can absorb it, or more typically when a combination of all these conditions exists. Storm water runoff can cause erosion and may transport sediments some distance from their source depending upon the intensity of the runoff, vegetative cover, soil characteristics, and topography.

The biological resource investigation noted previously found that the dry coulee crossing the proposed landfill expansion area does not have a defined channel. In addition, the coulee lacks evidence of vegetation that thrives in wet conditions and contains no evidence of even periodic intermittent flows resulting from the overland flow of significant excess runoff. Consequently, most natural surface water flows currently infiltrate into the porous alluvium throughout the drainage area rather than channelizing to flow down the coulee. Any natural flows reaching the Missoula valley floor at the mouth of the dry coulee through the culvert beneath Interstate-90 also appear to infiltrate before reaching any jurisdictional waters. The biological resource investigation concludes that the only potential for clean runoff to discharge from the site will be that resulting from an unusually high natural discharge event. If this was to occur, such flows will most likely be captured by infiltration into the surface gravel deposits surrounding the active gravel pit at the terminus of the coulee so that any potential downstream interception with state waters is unlikely. There are also no surface water bodies to constitute potential receiving waters in the vicinity of the proposed expansion. Therefore, the proposed diversion of natural runoff from the proposed expansion area and into the central coulee for infiltration and natural drainage would likely have almost no potential for impacts on downstream state surface waters.

Storm water that accumulates outside the active landfill areas will be directed to a storm water pond through a system of ditches, channels, and perimeter berms. The run-off and drainage control features for the proposed expansion site were conservatively designed to carry the peak discharge resulting from a 100-year, 24-hour storm event and to provide extra capacity for potentially excessive upgradient flows during a large storm event. Construction of the storm water detention pond will allow the facility to collect and retain water and sediments generated by runoff after a storm event.

The drainage network for the active and closed landfill units in the proposed expansion area will be constructed to convey storm water at velocities that will adequately control peak run-off volume while minimizing erosion. The surface water control plan for the active and closed disposal units in the expansion area will maintain BMP's to support an integrated system of ditches, channels and perimeter berms routed to a storm water detention pond. The pond is designed to contain a surge of storm water generated from an intense rainfall or snowmelt event, retain the suspended sediments that would otherwise be contained in storm water runoff, and then control the slow release of the collected clean water through a gated valve and weir to

minimize the downstream impact of storm-induced flooding. Any necessary discharge from the storm water detention pond is regulated by the facility's General Industrial Storm Water Discharge permit. Any discharge under the permit would require notification and sampling for total suspended solids and iron to ensure that released waters are not depositing sediment downstream.

Due to the ephemeral nature of the downgradient watershed and the proposed storm water controls, impacts to surface water from the construction and operation of the expansion area are expected to be minor, as currently maintained at the active AWSM Landfill facility.

All runoff from the active disposal units in areas with only daily cover and at the working face will be contained within the landfill unit as leachate and captured in the leachate collection system. For other inactive disposal areas, placement of intermediate cover (minimum 1-ft thick) and management of a system of temporary berms will provide a means for diversion of runoff away from the working face and active areas for routing to ditches that flow to the storm water pond.

All erosion control measures incorporated in the proposed site design and BMPs utilized during operations will include the following elements to minimize scouring and sedimentation:

- Collection and control of run-off, diverting it away from highly erodible areas.
- Construction of intermediate and final landfill slopes with drainage benches at intervals designed to control slope run-off velocities and volumes for routing to the storm water detention and sediment pond.
- Hydroseeding with fast germinating grass seed on intermediate surfaces that will be exposed long-term and on all areas that have reached final covered grade prior to closure.

Placement of a water-balance, alternative final cover during either partial or final closure of the waste disposal unit areas will incorporate a viable 6-inch topsoil layer to rapidly support re-vegetation by native species that thrive and prevent soil erosion over the long term well beyond post-closure care.

Groundwater —The AWSM Landfill and the proposed expansion site is situated on terrace foothills that transition from older basin-fill sedimentary rocks to unconsolidated alluvium and finally to the youngest glacial lakebed silts and coarse outwash deposits that cap the valley. The local hydrogeology can be broadly divided based on the topography and age of the geologic units (Hushmand Associates, 2012; Harris, 1997). The lower Tertiary sedimentary rocks and upper unsorted alluvium underlying the foothills or terraces of the expansion area are comprised of much older, semi-consolidated to harder cemented, basin fill materials. The flat, low-lying portion of the valley is underlain predominantly by younger unconsolidated, alluvial sediments that are capped by Pleistocene-age glacio-lacustrine and highly permeable glacial outwash deposits that host the highly productive Missoula Valley Aquifer at depth.

The upper Tertiary sedimentary rock strata visible at the surface may contain permeable coarse-grained units, but are usually dry. Within the lower Tertiary strata, some conglomerate and mudstone units buried beneath the bench terrace are saturated. However, the permeability of these saturated beds is apparently very low and the monitoring wells completed in the units in the expansion area (B-21, B-22 and B-23) currently yield only limited amounts of low quality water.

A shallow perched saturated zone originates in the coulee axis upslope and upgradient to the north and probably extends southward under the edge of the upper expansion area. A small spring seeps from this perched saturated zone into the pond that is located at the residence uphill

in the coulee axis, approximately 200 feet outside the northeast corner of the expansion boundary. The spring likely emanates from a porous layer near the contact of the more permeable weathered, overlying upper Tertiary unit with the less permeable beds of the consolidated, underlying lower Tertiary unit at an elevation of approximately 3,480 feet amsl. Monitoring well B-23 is located downhill within the proposed expansion area boundary, approximately 400 feet south of the spring. The upper Tertiary unit is found at well B-23 in the upper 30 feet; the well is completed below the contact within the lower Tertiary unit. The static water level in well B-23 is approximately 3,440 feet, or 40 feet lower than the upgradient spring. It therefore appears, from the limited data, that the contact between the Upper and Lower Tertiary units is an erosional unconformity and is the likely source of seepage. The elevation of this erosional unconformity appears to vary from 3440 to 3480 feet above mean seal level. Therefore, where seepage is encountered after excavation of the side slopes within this range of elevations, adjustments to the lower component of the composite liner is required and the subdrain system will be extended during construction to dewater such areas.

Groundwater in the expansion area was characterized by sampling monitoring wells B-21, B-22, and B-23 during April, 2013. Groundwater samples from the wells were analyzed for all detection monitoring program constituents. Based on the results of groundwater monitoring, facility wells are completed in a Class II groundwater quality aquifer (groundwater with specific conductance ranges from 1,000 to 2,500 µSiemens). Class II groundwater is only marginally suitable for beneficial uses including drinking water, irrigation for some agricultural crops, water for livestock and wildlife, and most commercial or industrial uses. Background trace metal concentrations were low to non-detect in all wells.

Three additional monitoring wells proposed for the expansion area will be installed at least one year prior to the commencing disposal activities in the expansion area in order to obtain seasonal background groundwater quality data. The proposed groundwater monitoring network for the expansion area will incorporate the newly installed monitoring wells into the existing monitoring well network of the active AWSM Landfill. Groundwater monitoring will be performed on a semi-annual basis during the active life of the facility and the 30-year post closure care period. The facility will notify DEQ two weeks prior to each sampling event to allow for scheduling of appropriate project oversight visits.

No impacts to the spring originating uphill outside the expansion area are expected. Some seepage from it may, however, be encountered where permeable layers near the base of the upper Tertiary unit emerge in the upper landfill cut. Impacts to the confined lower Tertiary aquifer are not expected, because the saturated permeable layers are variably intercepted at screened depths between 80 to 100 feet (wells B-21 and B-23, piezometer PZ1D) providing reasonable separation from the landfill base. Water quality is poor and production very low. Although the static water level consistently rises to near the elevation of the landfill base and head appears to consistently increase uphill (consistent with a saturated zone that follows dip of beds into hills), an isolated aquifer is difficult to identify. Potential impacts to terrace groundwater by the landfill expansion will also be mitigated by protection from the base composite liner and LCRS, but indicator parameters will be closely monitored as outlined in the groundwater monitoring section below

Nearby Groundwater Supply Wells — Locations of all wells, including public water supply wells, within one mile of the proposed expansion area boundary were identified by a query of the Groundwater Information Center (GWIC) database from Montana Bureau of Mines and Geology (MBMG). The closest public water supply well to the expansion area is at Travelers Inn Motel. Based on the well information in the MBMG database, the average total depth of the wells in the

area surrounding the landfill expansion is 92.81 feet. The depth to water ranges from near surface to 153 feet below ground. The average static water level is 51.57 feet.

3.0 Geology

The bench terrain in the vicinity of the AWSM Landfill facility consists of northeast trending ridges and coulees originally formed by extensive pre-glacial erosion of the underlying sedimentary sandstone and shale bedrock strata. These relatively young Tertiary sedimentary strata initially formed in small isolated basins paralleling the main Rocky Mountains. Brief resurgence later tilted these beds to slope downward into the hills beneath the AWSM Landfill facility, with recharge to some of the exposed permeable layers trapping groundwater at depth on the bench. Another younger cycle of deposition ensued, forming another sequence of younger Tertiary strata in the basins.

Recent and continued crustal stretching widened the valleys, when younger unconsolidated sediments again shed from the highlands and blanketed the eroded terrace with stream (alluvial) deposits. Alluvium is derived from unconsolidated sediments that have been eroded and redeposited by water in a non-marine setting and is made up of a variety of fine to coarse-grained sand, silt, clay, and gravel. Erosion during the cyclic rise and fall of the relatively recent Pleistocene Glacial Lake Missoula removed all remains of the youngest associated lakebed (and ash) deposits, and much of the most recent alluvial deposits from the bench terrace, to form broad alluvial fans that drape from the terrace into the valley at its flank. Remnants of these fans are now buried in the valley adjacent to the mouth of the coulees, are enclosed at depth by glacial lakebed silts, and probably drain groundwater from the bench at the valley margin.

Sedimentary rocks exposed and eroded on the terrace at the active and proposed AWSM Landfill sites form two distinct ages of Tertiary deposits separated by an erosion surface: they are designated simply as the Upper and Lower Tertiary by Harris (1997) from exposures excavated at the active AWSM Landfill in 1995 and from surface mapping at the proposed landfill expansion area. Alluvium, consisting of weathered slope wash, predominantly covers the surface today and hides much of the underlying bedrock. This weathered alluvial material comprises 10 to 25 feet of mostly remnant gravelly sand with cobbles and boulders derived from the upper Tertiary unit upslope. Artificial fill covers the southeastern slope of the landfill expansion area and was placed by landfill operations to stockpile excess material generated during earlier lateral expansion of existing cells.

The lower Tertiary strata are highly variable and consist of claystone, coarse conglomerate, mudstone, siltstone, sandstone, ash and coal. Brick-red lateritic staining or cementation is common and localized calcium carbonate strongly cements some conglomerates. On average, the beds strike northwest and dip northeast at 20 degrees sloping into the hills. Some units of conglomerate to mudstone strata within the lower Tertiary are saturated at depth apparently hosting a confined aquifer that extends beneath the bench terrace in the expansion area.

The largely horizontal, upper Tertiary strata rest upon the sloping lower Tertiary strata with a 20 degree angle between beds at the unconformity. Upper Tertiary strata were encountered at two locations beneath the alluvium. The upper Tertiary sedimentary rock is generally poorly cemented reddish brown, coarse conglomerate with interbeds of volcaniclastics (mostly ash), siltstones, and claystones. As previously noted by Harris (1997), and confirmed during recent drilling of the expansion area, the upper Tertiary sedimentary rock strata visible at the surface in the upper coulee contain permeable very coarse-grained units (alluvial fan deposits). Yet they are mostly dry, except for some seepage at the base contact with the lower Tertiary unit observed

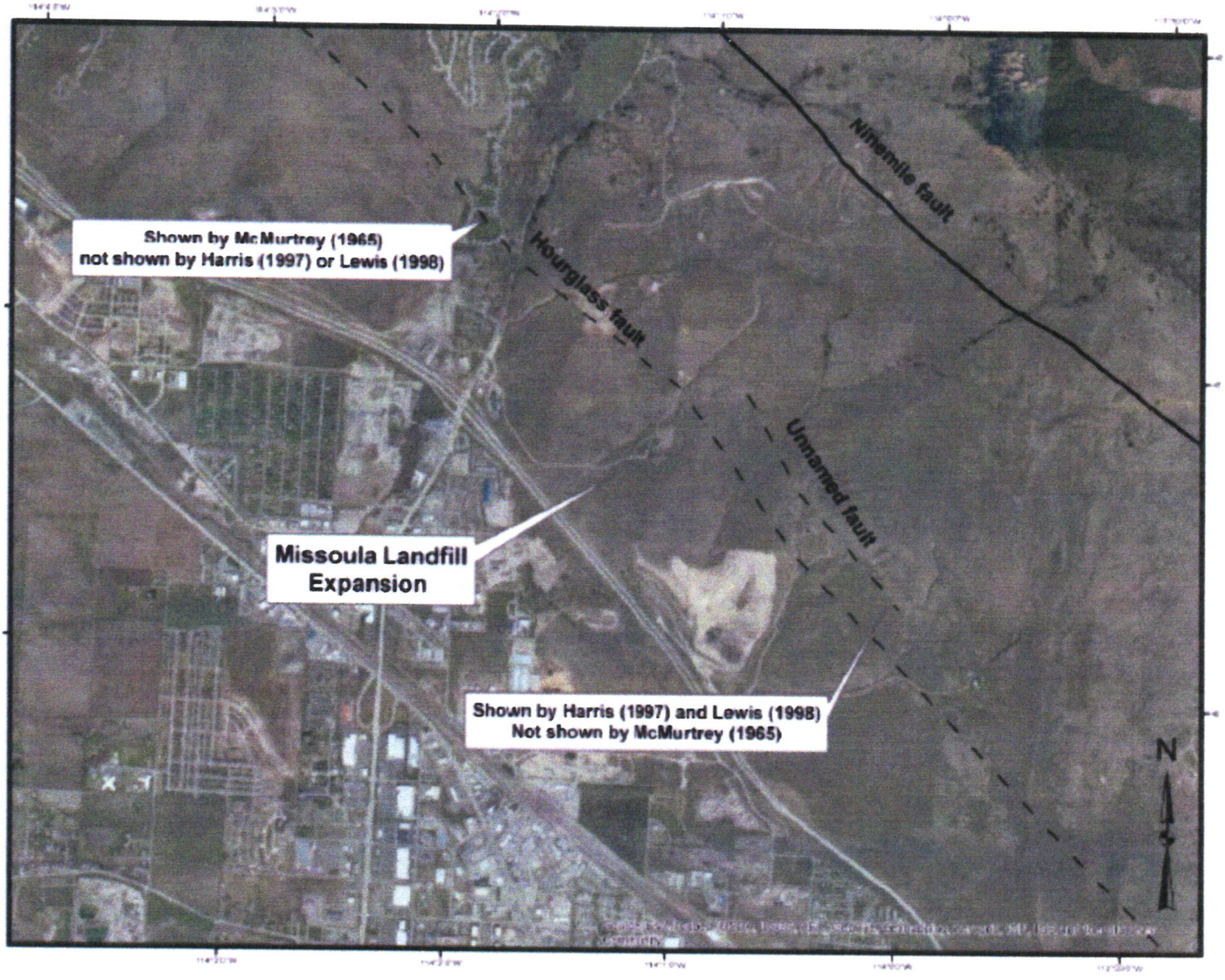
as a spring in the coulee uphill of the expansion area. As a result, adjustments to the lower component of the composite liner is required and the subdrain system will be extended during construction to dewater areas where seepage is observed.

Landfill Stability — According to ARM 17.50.1006, a Class II landfill may not be located within 200 feet of a fault that has had displacement in Holocene time (<10,000 years), unless the applicant successfully demonstrates that an alternative setback distance will prevent damage to the disposal unit. The Ninemile fault (Figure 3.1), located 1.4 miles north of the SWSM landfill, is the nearest visible fault with Mesozoic to mid-Tertiary displacement (>5 million years). This fault defines the east margin of the Missoula Valley. The Bitterroot fault, another Tertiary age fault, is located 9 miles south of expansion site and defines the western edge of the Missoula-Bitterroot valley and steep east face of the Bitterroot Mountains. These nearby faults parallel a system of other active faults to the east that include the Mission (25 miles), the Swan (32 miles), and the South Fork faults (54 miles). All of these faults parallel a northwest-trending local zone of elevated regional seismic activity that extends from Bozeman to Kalispell. Although none of these faults have had displacement during the Holocene time, or lie within 200 feet if the expansion area, the sum of their effects was evaluated to ensure the facility is designed to withstand seismic movement.

For an areal (composite) source earthquake with a hypothetical epicenter located at the AWSM Landfill site, the U.S. Geological Survey (USGS) estimate of peak horizontal ground acceleration (PHGA) of 25% of gravity (0.25g) was used to calculate deformation. The average shear wave velocity for near surface rocks was estimated at 1,903 feet per second (580 m/s). Based on the average source and wave energy estimates from the site borehole investigations, the design earthquake yields an acceptable maximum permanent deformation of landfill features at only 1.2 inches.

Subsurface conditions that may affect the landfill liner stability in the expansion area were also investigated by a network of on-site boreholes. A very stiff, plastic clay or claystone was encountered at a depth of 25-ft below ground surface beneath the proposed expansion footprint, where the layer may not be completely removed during excavation. Samples of the clay were lab tested for consolidation over a range of appropriate stresses. Evaluation of the consolidation data for this clay layer indicates adequate stability beneath the landfill base at loads predicted after proposed final closure of the expansion area.

Figure 3.1: Location of nearest faults



(Source: SWT Engineering, Republic Missoula Landfill Expansion Application, 2013)

The evaluation of all tests and analyses were included in the landfill geotechnical stability report (Hushmand, 2013). The results demonstrate that all landfill containment structures, including the landfill liner and final cover, leachate collection and removal system, surface water control system, and landfill gas control system are designed to resist the maximum horizontal acceleration predicted for the expansion site. Additionally to ensure adequate waste mass and liner stability associated with the proposed 230-ft high, maximum cut (southeastern slope), the base design places two 70-ft wide horizontal benches evenly spaced within 80 feet from the floor of the proposed landfill base.

4.0 Soil Quality, Stability, and Moisture

The predominant soil type is the Argixerolls-Haploxerolls complex (index 9, Figure 3.2), consisting of well-drained soils, with cobbly and stony surface layers to 19 inches and a high capacity to transmit water. The secondary soil type is the Riverside gravelly sandy loam (index 22, Figure 3.2), an excessively drained soil, with a high capacity to transmit water. A typical profile from top to bottom shows: 0 to 9 inches of gravelly sandy loam; 9 to 16 inches of very gravelly sandy loam; and 16 to 60 inches of extremely gravelly loamy sand.

The minor soil type is Moiese gravelly loam (index 72, Figure 3.2) which is classified as excessively drained, with a high capacity to transmit water. A typical profile from top to bottom shows: 0 to 9 inches of gravelly loam; 9 to 21 inches of very gravelly sandy loam; and 21 to 60 inches of extremely gravelly sandy loam.

Figure 3.2: Map of three soil types developed on the bench terrace in the expansion area
(Source: U.S. Department of Agriculture, Natural Resources Conservation Service)

SOIL KEY
9: Argixerolls-Haploxerolls Complex
22: Riverside Gravelly Sandy Loam
72: Moise Gravelly Loam

Any impacts to geology and soils are anticipated to be minor due to some rock exposure by the landfill cut after removal of soils and placement in cover stockpiles. The rocky soils and bedrock layers are not good substrate for agriculture. Because these soils are well drained, construction and operation of the proposed facility would not result in soil erosion or the substantial loss of viable topsoil through appropriate placement of berms, ditches, and BMPs minimizing erosion. Additionally, the landfill design consists of a standard composite liner designed to impede the flow of liquids. The clay liner component of the liner system has a hydraulic conductivity of not more than 1.0×10^{-7} cm/sec, meaning that any liquids passing through the clay liner would pass through at a rate of 0.0000001 cm/sec or 0.02069291 inches per year.

5.0 Vegetation Cover, Quantity, and Quality

The foothills at the expansion site are partly wooded or shrub- and grass-covered prairie habitat. Adjacent lower intermontane valleys are largely grassland or partly shrub-covered and typically support a mosaic of terrestrial and aquatic flora and fauna that are distinct from species in the nearby mountain highlands. In the immediately adjacent forested mountains northeast of the expansion site, Douglas-fir and Ponderosa pine habitat merges into subalpine fir-Engelmann spruce forests and alpine areas with elevation farther east.

Based on a search of the Montana Natural Heritage Program database, the biological resource investigation report (Hydrometrics, 2013) listed the records of all possible threatened and plant species of concern. After conducting a field survey of the local area surrounding the proposed facility, little natural habitat (<1%) was found that was not degraded by heavy grazing activities. The vegetation on the expansion site consists predominantly of invasive, non-native plants that were planted or have colonized the site following a history of heavy livestock utilization. Small patches of indigenous vegetation are found on less than one percent of the entire expansion area where remnant native species are limited to bluebunch wheatgrass, needle-and-thread, Sandberg's bluegrass, silky lupine, scarlet gaura, and hairy golden aster. The few woody shrubs found were either introduced (*e.g.*, lilac, willow, Russian olive, and Japanese honey suckle) at the single residence or naturally succeeded (Douglas hawthorn) as scattered remnant individuals along the ephemeral coulee that drains the proposed expansion area.

The dominant plants are species adapted to disturbance such as tumble mustard, sulfur cinquefoil, leafy spurge, bulbous bluegrass, and cheatgrass. Noxious weeds include leafy spurge, sulfur cinquefoil, spotted knapweed, and hound's tongue. Other invasive species on the site include cheatgrass, tumble mustard, flannel mullein, and non-native grasses (e.g., smooth brome, timothy, Kentucky bluegrass, crested wheatgrass, and Canada bluegrass).

During construction and operation, most plant species will be removed from the proposed 86-acre disposal unit. The topsoil removed during site development will be stockpiled within the licensed boundary for use in the vegetative layer at the top of the alternative final cover. As portions of the landfill are filled to their final grade and covered according to an approved Closure Plan, these areas and soil stockpiles will then be re-seeded with native plant species appropriate to the area as recommended by the U.S. Natural Resource Conservation Service (NRCS) at the time of closure.

Consequently, the overall permanent impacts of the landfill construction, operation, and closure activities on the native prairie vegetation will be minor, but positive. The proposed expansion area is currently significantly degraded by invasive and noxious species with very little indigenous vegetation remaining in isolated small patches. The impacts of soil amendments, reseeding of native species according to NRCS specifications will be positive, because the post-closure vegetation will provide for a better diversity than the existing vegetation.

7.0 Air Quality

The shift of all operations into the expansion area would not increase the dust impacts beyond those experienced at the currently active AWSM Landfill facility. Air quality concerns related to landfills are frequently associated with fugitive dust emissions from landfill traffic, construction activities, and day-to-day facility operations. Dust control measures currently implemented

according to the approved O&M Plan at the currently active AWSM Landfill facility will continue to be implemented in the expansion area. Therefore, the overall impact should be minor.

Excavation and traffic within the new expansion area due to construction will cause an increase in the levels of airborne dust relative to the previous grazing activities, especially during the dry months of the year. However, since construction periods will be short in relation to the operating life of the facility, these effects will be minor overall. The progressive closure of the existing active AWSM Landfill as excavation of the expansion area develops will likely offset construction impacts so that the overall effect on air quality remains nearly the same as when the active facility was fully operational.

The excavation and placement of cover material could increase the dust in the air. If it becomes a problem, the cover material will be wetted prior to its placement so that the net effect will be minor. All long-term soil stockpiles will be seeded to prevent erosion and airborne dust.

TABLE 3.6 - IMPACTS TO THE HUMAN ENVIRONMENT

HUMAN ENVIRONMENT	Major	Moderate	Minor	None	Unknown	Attached
1. SOCIAL STRUCTURES & MORES:				✔		
2. CULTURAL UNIQUENESS & DIVERSITY:				✔		✔
3. DENSITY & DISTRIBUTION OF POPULATION & HOUSING:				✔		
4. HUMAN HEALTH & SAFETY:				✔		
5. COMMUNITY & PERSONAL INCOME:				✔		
6. QUANTITY & DISTRIBUTION OF EMPLOYMENT:			✔			✔
7. LOCAL & STATE TAX BASE REVENUES:			✔			✔
8. DEMAND FOR GOVERNMENT SERVICES:			✔			✔
9. INDUSTRIAL, COMMERCIAL, & AGRICULTURAL ACTIVITIES & PRODUCTION:			✔			✔
10. ACCESS TO & QUALITY OF RECREATIONAL & WILDERNESS ACTIVITIES:				✔		
11. LOCALLY ADOPTED ENVIRONMENTAL PLANS & GOALS:				✔		
12. TRANSPORTATION:			✔			✔

ANALYSIS OF TABLE 3.6 - POTENTIAL IMPACTS ON HUMAN ENVIRONMENT

This section evaluates the potential environmental effects that may occur on the human environment if the proposed facility is approved. The number on each of the underlined resource headings corresponds to a resource listed in the tables. Generally, only those resources potentially affected by the proposal are discussed. Therefore, if there is no effect on a resource, it may not be discussed.

2. Cultural Uniqueness and Diversity

A cultural resource file search was conducted for Section 5, T13N, R19W. The results of the file search indicated there have been no previously recorded sites within the area. Based upon previous ground disturbances in the area associated with agricultural activities, the State Historic Preservation Office (SHPO) determined that there is a low likelihood cultural properties will be impacted and therefore a cultural resource inventory is unwarranted. However, should cultural materials be inadvertently discovered during proposed excavation of the site, the SHPO requested they be contacted and the site investigated for additional cultural resources.

6. Quantity and Distribution of Employment

During the construction phases of the landfill expansion, especially during the initial startup of the expansion area operations, there could be a minor increase in local employment due to the additional need for contractors, site operators, and associated support. The effects on employment due to normal operations would be similar to previous effects before closure of the current landfill.

7. Local and State Tax Base and Tax Revenue

There will likely be some additional workers hired as the Missoula waste stream grows and also during the construction phases of the proposed landfill expansion, so there could be a minor positive effect on the local tax base and revenue. Excepting growth, the total effects on tax base and revenue due to normal operations would be similar to previous effects before closure of the older landfill unit.

8. Demands for Government Services

The potential impact of the proposed facility expansion is expected to be minor. The Missoula County Environmental Health Department and DEQ's Solid Waste Section will perform inspections of the site both during and after construction, a routine activity. During the construction phases, there may be a slight increase in traffic on the roads leading to the landfill, but the additional impact to local law enforcement and road maintenance crews is expected to be minor because there will only be a few additional contractors involved over a relatively short time period.

The effects on government services due to normal operations would be similar to previous effects before closure of the older landfill unit.

9. Industrial, Commercial, and Agricultural Activities and Production

Construction of the proposed facility expansion will cause a minor, but temporary increase in the industrial activity of the area due to the need for contractors and associated materials and machinery repairs.

Agricultural activities in the expansion area consisted primarily of livestock grazing, but the parcel had become significantly degraded for grasslands necessary to support an extensive viable herd of cattle. Removal of the 144-acre parcel from agricultural production would thus have a minor effect on the extensive and abundant agricultural production of the Missoula and adjacent Bitterroot Valley. Likewise it would have no additional industrial or commercial impacts.

12. Transportation

Access to the AWSM Landfill expansion site will remain as before. The gate at the southeast corner of the active facility will be accessed from Coal Mine Road through the north industrial area adjacent to the railroad and interstate in Missoula. The additional effects on transportation due to normal operations would be minor.

SECTION 4.0 — CONCLUSIONS AND RECOMMENDATIONS

A listing and appropriate evaluation of mitigation, stipulations and other controls enforceable by the agency or another government agency:

The proposed licensure of the Allied Waste Systems of Montana Class II landfill facility expansion will meet the minimum requirements of the Montana Solid Waste Management Act and administrative rules regulating solid waste disposal. Adherence to these DEQ licensing criteria will mitigate the potential for harmful releases and impacts to human health and the environment by the proposed facility. Along with standard criteria for the Solid Waste Management System License as issued by the DEQ, and as validated by the local Missoula County Health Officer, no new or site-specific license conditions are necessary beyond the change in the total licensed area from 141 to 285 acres.

Recommendation:

DEQ's recommendation is to distribute the EA to adjacent landowners and interested persons to satisfy the public notification and participation requirements of MEPA.

Findings:

DEQ has determined that the proposed landfill facility expansion, located on private property adjacent to the currently active AWSM Landfill, will have a minor additional impact on the surroundings relative to ongoing landfill activities at the old landfill unit. Operations at the existing active landfill will be phased out and the landfill closed as active landfilling operations commence in the expansion area. The expansion area will be fenced, access will be controlled at all times, and all landfill activities will be performed according to the approved Operation and Maintenance Plan that would initially follow the currently approved plan for the active facility. Site activities will be verified by periodic inspections performed by DEQ and/or Missoula County personnel to ensure that the potential risk of adverse effects on human health and the environment resulting from operation of the facility are minimized. As a result, DEQ finds that an EA is the appropriate level of analysis and an Environmental Impact Statement is not needed.

If an EIS is needed, and if appropriate, explain the reasons for preparing the EA:

DEQ finds that an Environmental Impact Statement is not necessary due to the mitigating factors provided by the solid waste rules and the applicant's proposal for licensure of the landfill facility expansion at the selected location. Consequently, the combined effect of all such factors at the site will ensure to a reasonable extent that any potential direct or cumulative impacts to human health and the environment from the proposed Phase-2 landfill unit are minor.

If an EIS is not required, explain why the EA is an appropriate level of analysis:

DEQ finds that construction, operation, and post-closure care of the proposed expansion area will not significantly affect the quality of the human environment both within and surrounding the local area. The proposed project will be reasonably expected to have minor impacts on terrestrial life, vegetation and other aspects of the physical and human environment relative to the current use of the site. Based upon the facility design and operational controls, the elevated location on a bench above the Missoula Valley, and the separation of the waste from groundwater, there are no anticipated impacts to groundwater resources from the disposal of Group II, III, and IV wastes at the site. Therefore, an EA is the appropriate document to address

the potentially minor impacts of the proposed licensure of the Allied Waste Systems of Montana Class II Landfill facility expansion.

Other groups or agencies contacted or which may have overlapping jurisdiction:

Missoula City-County Health Department
Montana Natural Heritage Program
State of Montana Historic Preservation Office
U.S. Environmental Protection Agency
U.S. Department of Interior - Geological Survey
Montana Bureau of Mines and Geology
U.S. Department of Agriculture - Natural Resource Conservation Service

Individuals or groups contributing to this EA:

Allied Waste Systems of Montana, LLC
Montana Bureau of Mines and Geology
Natural Heritage Program
Republic Services, Inc.
State Historic Preservation Office
SWT Civil & Environmental Engineering
U.S. Department of Agriculture - Natural Resource Conservation Service
U.S. Department of Interior - Geological Survey
U.S. National Oceanic and Atmospheric Administration

EA prepared by: Mary Louise Hendrickson, Tim Stepp, and John Collins – Montana DEQ, Solid Waste Section

Date: December 5, 2014

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